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ABSTRACT

The manual is intended for use as a practical guide to selecting teaching strategies. Based on compiled research findings, published methodological suggestions, and ideas related to the teaching-learning process, the manual consolidates a review of the results of major research into simplified principles and instructional strategies to be utilized in various educational settings. Where appropriate, specific illustrations are offered as practical examples of how these principles can be applied in classroom situations. The book is organized by types of learning, conditions which affect learning, and teaching functions and instructional strategies. Each of the book's five units opens with a statement of objectives, followed by several learning activities or exercises, apparently intended for teacher educators to employ with classes of education students. These suggested learning activities are followed by information presented in outline form and divided into chapters. (Author/AJ)

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Principles of Learning and Instruction: Classroom Application for Teachers

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Table of Contents

Acknowledgements. i

Foreward. iii

Unit I Introduction to learning 1
Categories of learning 2

Unit II Principles and illustrations of types of learning. 9
Lesson A: Cognitive learning. 10
Lesson B: Psychomotor learning. 19
Lesson C: Modeling and observational learning 29
Lesson D: Affective learning. 30

Unit III Principles and illustrations of Conditions which affect learning. 35
Lesson A: Principles related to motivation 36
Lesson B: Conditions of practice. 43
Lesson C: Group vs Individual learning; Competition vs Cooperation 48
Lesson D: Transfer of training. 60
Lesson E: Feedback, reinforcement, success and failure. 69

Unit IV Principles and illustrations of teaching functions and instructional strategies . 78
A. Dealing with individual differences within the classroom 91
B. Dealing with individual differences outside the classroom. 92
C. Suggested techniques for teaching slow learners. 92
D. Instructional guidelines related to the use of media in teaching 96
Summary of steps in media selection. . . 101

Unit V Summary and Review: Some selected important principles of learning 106

Bibliography. 109

Foreward

This manual is intended for use as a practical guide to selecting teaching strategies. It is based on compiled research findings, published methodological suggestions and ideas related to the teaching-learning process. While much of the contents are not original or unique contributions of the authors, it is hoped that the accumulation of the opinions of learning specialists and the illustrations of learning situations will justify the efforts of this project.

Research studies which investigate the learning process provide knowledge about how learning takes place, the conditions which affect it and the strategies which best promote it. This knowledge when verified and systematized, leads to the development of principles which suggest methods and practices to be used in the classroom to implement the learning process. Such principles can disclose the limits of what is possible in instruction especially in the planning of lessons and classroom activities. Knowledge of learning principles can guide the teacher's methodological approaches and choice of instructional strategies intended to promote effective learning.

Finally, in the evaluation of learning outcomes, principles of learning provide the means for comparing what students are capable of doing with what they are expected to have learned. This manual represents an attempt to consolidate a review of the results of major research and publications on learning into simplified principles and instructional strategies to be utilized in various educational settings. Where appropriate, specific illustrations have been offered as practical examples of how these principles can be applied in classroom situations. It should be noted that some of the information was extracted from the authors' initial publication and modified for inclusion in this manual.

Unit I Introduction to the Learning Process

Objectives: To familiarize the teacher with the generally acceptable definitions of learning; To identify some specific illustrations of various catetories of learning; To provide justifications for the necessity of teachers having adequate knowledge of the learning process and the principles which are related to it.

Suggested Activities:

1. List and compare the various types of learning you observe occuring in the classroom; outside the classroom.

2. Have your students role-play activities which illustrate the many varieties of learning. (e.g., pupils pantomiming the manual expressions involved in the use of various tools -- from simple to complex tools such as hammer, saw, boring drill, lathe, etc.)

3. Develop transparencies or other visual aids (posters, slides, etc.) which would help illustrate various forms of learning which take place every day throughout our lives.

4. Discuss with students the ways in which classroom learning experiences can be used later in adult life. The research tells us that while we are relatively effective in teaching pupils what to learn, we generally don't provide

adequate explanations as to why we learn, and what useful purposes school learning provides us in "real-life" situations.

Instructional Guidelines: Since this is a relatively short but important introductory unit, it is suggested that the teacher spend additional time in developing concrete applications of the basic concepts presented. For example, making a list of the types of learning which take place as they occur in the classroom setting.

Information:

Introduction to the Learning Process. Learning has been defined as a change in behavior (in the broadest sense of the term, including skills, responses and knowledge) as a result of experience. Learning is a process that results in several products, primarily in the form of changes in specific types of behavior. The quality of any educational system is generally defined in terms of such changes in learner behavior. These changes in various specific ways of behaving have often been referred to as types of learning. Some of these types or categories of learning are listed below:

1. Simple responses are associations of previously established behavior with a new stimulus, such as

a baby crying when an unfamiliar face is presented. (also called stimulus-response learning).

2. Muscular habits include both simple and complicated organizations of motor skills, such as walking, grasping, writing, or driving an automobile. (psychomotor learning)

3. Perceptual responses are our interpretations of sensory impressions. We see, hear, or receive other sensory messages in terms of our experience which gives it meaning. For instance, we hear a sound which we interpret as a plane overhead. The sound, therefore, has a meaning to us. To someone who has never heard a plane the sound would be meaningless.

4. Motives are for the most part learned. Social or psychological motives are learned through our interaction with the environment. The ways in which we satisfy many of our physiological motives are learned. We learn, for instance, when to eat and what to eat, as well as how to eat.

5. Attitudes may be described as a variety of predispositions to respond to selected aspects of the environment. Attitudes toward people, places, institutions, or objects are learned. Attitudes are generally positive or negative, as for example, our attitude

toward capital punishment or a particular political candidate.

6. Emotional responses are also learned. Even though the visceral response is reflexive and involuntary, we learn the objects of fear and love. We also learn through the socialization process how to express our emotional responses. (Emotional or affective learning)

7. Problem solving is one of the most sophisticated learnings of man. This involves the application of old experiences and skills to a new problem or situation, such as when a man lost in a forest follows a stream or uses a compass to avoid wandering around in a circle.

8. Language is the learned system of expressions (such as words and symbols) with which we are able to represent the world around us and to communicate with others.

9. Personality is the personal and unique pattern of traits and tendencies of an individual. Most of our personality attributes are generally learned, although they are also influenced by hereditary forces.

10. Transfer of training is the application of a previously learned response to a new situation. (Transfer learning)

11. Memory is the function governing remembering and forgetting. The skill or mechanical process involved in retention is a learned behavior.

12. Creativity is the capacity to think and act with originality, spontaneity, innovativeness, and inventiveness. While the issue remains equivocal there are many who believe that creativity is for the most part a learned trait.

These specific types of learning or products of the learning process have been distinguished here for semantic convenience only. However, it should be understood that these concepts are not necessarily interdependent or unrelated but, in fact, may be highly interrelated in some cases.

The classroom teacher must have an adquate knowledge of the principles and laws which govern the learning process especially as they may contain relevance for the specific types of behavior involved in the instruction of his particular skill area. As a result of the extensive review of the literature available on this broad topic, a compilation of such learning principles was developed. Where possible, an attempt was made to provide illustrations and examples of actual classroom situations which tend to typify or demonstrate the practical implications of each principle.

Teachers are sometimes inundated by information and communications from college courses, teacher's manuals and textbooks, in-service training activities, administrators, the media, advertisements for school equipment and textbook series, and many other sources, on the subject of how to effectively promote learning in the classroom. Because teachers are designers of instructional strategies, they are often faced with the dilemna of choosing among many educational products and methods in order to accomplish desired objectives. A sound knowledge of verified principles of learning and learning theories will significantly facilitate this decision-making process. Understanding of learning principles and theory is also important for the successful delivery and management of instruction which requires that teachers arrange and structure the learning environment in such a way that students achieve educational objectives most effectively. This important phase of teaching is critically dependent upon knowledge of the learning process and the principles which govern it.

Thus, a knowledge of learning principles can reasonably be expected to assist in the planning stages of instruction, in the actual conduct of instruction by guiding the teacher's choice of strategy, and finally in assessment procedures where principles help to identify means of comparing what the learner is able to do with what he is expected to do. When teachers verify their activities against the standards of learning principles which have been empirically established, they first minimize grossly ineffective or inappropriate actions which fail to promote learning, and second, they establish attitudes which support learning as the focal point of their instructional activities.

The previous manual (Part I: 1974) contained an extensive review of the relevant research related to the learning process. The present publication attempts to define and illustrate the major principles which have been compiled and summarized from the research evidence available. The list is by no means intended to be exhaustive but is rather assumed to be representative of the major conclusions derived from research on the process of learning. For semantic convenience the principles have been grouped into several specific sub-topics within the broader area of learning. The teacher is advised to try to identify specific examples based on personal experiences in the classroom which may serve to illustrate the principles presented. It is felt that such personal experiences will compliment the illustrations provided by the authors by permitting "first-hand" exposure to those principles which govern the learning process.

Unit II Principles and Illustrations of Categories or Types of Learning

Objectives:

To list and define in detail four specific kinds of learning processes that have relevance for vocational-technical education as well as other areas of education;

To provide examples of these four types of learning as they apply to the classroom;

To identify important principles which apply to these categories of learning;

To offer instructional guidelines and suggestions for implementing sound practices related to the principles which govern each type of learning.

Suggested Activities:

1. Find classroom examples for each of the categories of cognitive learning mentioned in Bloom's taxonomy.
2. Make sequential posters depicting the important steps in psycho-motor learning.
3. Schedule "activity sessions" in class during which a new psychomotor skill could be acquired each session. Specify that students would spend time independently in the practice of the skill in order to perfect it.

4. Use role-playing exercises in order to illustrate to students the process of modeling and observational learning.
5. Discuss in small group meetings with students some specific aspects of values, emotions and feelings as they relate to the classroom climate. How important is affective learning to the student's overall competence as a learner?

Information:

Categories of Learning

In this section some of these specific categories of learning which have special interest to the teacher are discussed. These include cognitive learning, psychomotor learning, modeling and observational learning, and affective learning. Although the following types or forms of learning are not mutually exclusive, independent discussion of each will help to show the complexity of the problems with which the teacher must deal.

Lesson A: Cognitive Learning - Perhaps the most comprehensive category of learning and the one that probably has the most significant application to education is cognitive learning. This category of learning encompasses the mental processes related to intellectual skills and the acquisition of knowledge.

Bloom (1956) has delineated the various sub-categories related to cognitive learning as follows:

Description of the Major Categories in the Cognitive Domain

1. Knowledge. Knowledge is defined as the retention of previously learned material. This may involve the recall of a wide range of material, from specific facts to complete theories, but all that is required is the bringing to mind of appropriate information. Knowledge represents the least complex level of learning outcomes in the cognitive domain.
2. Comprehension. Comprehension is defined as the ability to grasp meaning. This may be demonstrated by converting material from one form to another (words to numbers), by interpreting material (explaining or summarizing), and by estimatiig future trends (predicting consequences or effects). These learning outcomes go one step beyond the simple remembering of material, and represent the most basic level of understanding.
3. Application. Application is defined as the ability to use previously learned material in new and concrete situations. This may include the application of such things as rules, methods, concepts,

principles, laws, and theories. Learning outcomes involving this process require a higher level of understanding than those under comprehension.

4. Analysis. Analysis refers to the ability to break down material into its component parts so that its organizational structure may be understood. This may include the identification of the parts, analysis of relationships between parts, and recognition of organizational principles involved. Outcomes of analysis involve a higher intellectual level than comprehension and application because they require an understanding of both the content and the structural form of the material.

5. Synthesis. Synthesis refers to the ability to construct new wholes from separate parts. This may involve the production of a unique communication (theme or speech), a plan of operations (research proposal), or a set of abstract relations (scheme for classifying information). Learning outcomes in this area involve creative behaviors, with major emphasis on the formulation of new patterns or structures.

6. Evaluation. Evaluation is concerned with the ability to judge the quality or value of material (statement,

novel, poem, research report) for a given purpose. The judgments here are usually based on definite standards which may be either internal criteria (organization) or external criteria (relevance to the purpose) and the student may determine the criteria or be given them. Learning outcomes in this area are highest in the cognitive hierarchy because they contain elements of all of the other categories, plus conscious value judgments based on clearly defined criteria.

/Source: Stating Behavioral Objectives for Classroom Instruction by Gronlund, N.; The MacMillan Company, 1970./

Instructional Guidelines:

Activities representing cognitive learning as it occurs in the classroom include the following:

a) Observing
b) Comparing
c) Summarizing
d) Classifying
e) Interpreting
f) Problem solving
g) Criticizing
h) Imagining

i) Decision-making

j) Looking for assumptions

k) Working on larger projects

l) Hypothesizing

m) Remembering

n) Concept formation

a) Observation - Activities here would include observing and listening, feeling and smelling, tasting, and reporting sense impressions. As pupils share the results of the assignment with others in the room, they would be learning that we all do not see, hear, feel, smell, or taste the very same things. Sometimes we become more alert to what others are sensing and more discriminating as a result of this sharing process. Moreover, we almost never report everything we have sensed; we select what to report and give emphasis to some things.

b) Comparison - The teacher may require pupils to compare two or more things. The objects for such comparison may be drawn from quite a diversified list. They may be two students that are in the room, two leaves, or two trees. They could be two toys or two automobiles, two pictures or two short stories, two pieces of music or two poems; two translations of the same paragraph from a foreign language, two mathematical proofs, or two similar scientific experiments. Large concepts might be the focus of such comparisons: classicism with romanticism, an early work of an author with one of his later works, modern music with modern art, or the scientific philosophy of the seventeenth century with that of the eighteenth century. In industrial arts one particular design of woodworking could be compared to another. There is practically no limit to the topics and ideas which might be compared. The tasks of comparing and contrasting afford the student an opportunity to do some thinking.

c) Summarization - In summarizing, the student must abstract major points or highlights and consolidate them into a briefer formulation; this requires thinking. An appropriate assignment might involve summarizing a movie that has been shown, or a field trip, or a filmstrip. The students might be asked to prepare a summary of a short story or a book, of their vacation, or of a TV program. Here again, there are a great many opportunities which a teacher can use to emphasize this thinking operation.

d) Classification - Classifying activities provide students with opportunities to think. In the very earliest grades, pupils may be required to sort blocks or arrange beads. Older students can classify books, games, tools or clothing styles. Lists of words and phrases might be classified according to parts of speech. Again, a list of cities, countries, or rivers might present the challenge to organize and classify. Any classification task of this sort calls for thinking.

e) Interpretation - To interpret or to find meaning in an experience is the result of some in-depth thought about that experience. For the teacher to give a table of data or a graph to a student and ask, "What meaning does this have for you?" is to provide an opportunity to think. To interpret one's own experience requires thinking. To delve into the possible meanings of a poem, a picture, a piece of woodwork, a sheet metal structure, a dance, or a scientific discovery is to take an opportunity to think. The practical arts abound with such opportunities, and much the same can be said about every subject in the curriculum.

f) Problem-solving - Getting students to solve problems of one kind or another -- problems in mathematics or science, or shop or laboratory problems. Providing various practice situations or simulation activities in which students can solve problems.

g) Decision-making - Students frequently encounter situations which test their ability to make decisions. This is not always a question of what is the correct answer; it may simply determine what is the wisest decision to make in a given situation. Students should be asked to provide reasons which support the preferred alternative. In sizing up alternatives, considering the interests of all concerned, and anticipating consequences, genuine opportunities to think arise.

h) Imagination - Giving students an opportunity to use their imagination in order to visualize the future or the very distant past is to give them a chance to think.

i) Assumption-seeking - Looking for assumptions is another activity which involves thinking. It is usually motivated by a searching and critical analysis of some conclusion. It asks these questions: Has it been absolutely proven? If we 'swallow' this conclusion, are we also taking for granted something that has not been mentioned? What else must we also believe if we accept this conclusion?

j) Project work - Students may be at work on a large project--one involving several weeks of work and entailing the use of the library, shop resources, the writing of letters to specialists, and perhaps interviewing, poll-taking, or making and administering a questionnaire. It involves the planning of time and often involves committee and group work. To put large projects into operation is to give students many opportunities to think.

k) Hypothesis-formation - When students are faced with some of society's unsolved problems and are asked to suggest hypotheses for possible solutions--to have 'hunches' about ways of tackling the problems--they are learning to think. The problem for example, could be public apathy about juvenile crime, small voter turn-outs, traffic accidents at particular times or places, or weather predictions. It might deal with anything from increasing local income or decreasing taxes to drop-outs or drugs. In every subject area there are problems that have not been solved; students can learn from such endeavors.

l) Fact collection and organization - When students as a group have a chance to talk about problems they would like to work on, the teacher may list all of the suggested possibilities on the blackboard. From this list each student may choose one and reformulate it in his own words. Collecting facts and organizing them in terms of one's own purposes requires thinking.

m) Evaluation and criticism - Students should be given opportunities to evaluate and criticize something. This involves the identification of both strengths and weaknesses of whatever is being scrutinized. When students are required to give a basis for their comments, to demonstrate the relevance and the adequacy of their judgments, they are involved in the processes of thinking.

This listing is not intended to be complete. There are a great many other ways of providing students with opportunities to think. The ones presented include only some of the practices among teachers who put an emphasis upon thinking.

Lesson B: Psychomotor Learning

Teachers are often concerned with learning tasks that involve complex muscular responses, especially the use of equipment. Using a hammer, cutting sheet metal, operating a lathe, or building a cabinet are all relatively familiar skills to be learned by the industrial arts student. Psychomotor learning involves organized patterns of skill activities that are as much intellectual as physical.

The research on psychomotor or skill learning suggests that there are three basic phases in the development of most skills: an initial cognitive phase, a relatively extensive practice or application phase and a final autonomous phase. These are not completely distinct phases but rather tend to be developmentally continuous within the progression from one to the other. However, in most instances of skill learning the following sequence is more or less discernable:

1. Cognitive phase - here the learner attempts to mentally assimilate or to comprehend the fundamental aspects of the skill and the behaviors required to accomplish it. Traditionally, this initial phase has been implemented via the use of didactic instructional techniques such as textbooks, lecture and verbal exposition, although recent research has shown there is merit in learner participation and discovery approaches. Behaviors during this stage are slow and uncertain and the learner tends to be visibly conscious of each phase of the action pattern.

2. Practice-fixation phase - in this phase the essential component actions of the skill are practiced repeatedly to the point that the learner is able to repeat the correct pattern of action with a minimum of errors. Although the actual practice activity is the primary element of this phase, the cognitive phase remains active as the learner becomes more aware of the finer aspects of the skill and discovers various methods of avoiding or correcting any errors that he has been making.

3. Autonomous phase - it is here that the mature stage of the skill is attained. The pattern of the behavior becomes virtually automatic to the point that the learner can now perform the actions without intentionally concentrating on them. This final phase is characterized by many discernable facets: increased facility, speed and accuracy, proper timing, anticipation of most circumstances surrounding the task, knowledge of the finer points of the skill, etc.

In order to accommodate the development of this sequence, the teacher must effectively arrange and manipulate those situations or conditions which will lead learners to eventually modify their own behavior. In the teaching act, the instructor possesses the total plan and knows the skill or task in its entirety. Teachers familiar with the various component parts and how they comprise the whole and typically have a strategy or method for teaching the skill with the intention of transferring the program to the learner, who will hopefully develop an eventual degree of skill which is sufficiently stable so that it can be executed almost automatically with minimum need for voluntary control - in short, a habit pattern.

Educators have been interested in identifying the abilities necessary for the performance of many psychomotor skills. Fleishman (1956) has identified ten such abilities. These are listed in Table I.

TABLE I

Abilities in Motor Learning

Ability	Definition
Reaction Time	The speed individual can make a response to stimuli he is expecting
Tapping Ability	The speed with which an individual can perform a rapid movement
Psychomotor Coordination	Skillful, controlled arm or hand movements at a rapid rate
Finger Dexterity	Rapid manipulation of objects with the fingers
Psychomotor Precision	Involves speed as well as precision similar to finger dexterity but involves more eye-hand coordination
Steadiness	Steady Hand
Motor Kinesthesis	Person maintains upright position in unstable equipment such as simulated cockpit
Aiming or Psychomotor Skills	Skill in performing at high speed tasks such as making dots in circles
Ambidexterity	Skill in performing tasks by either hand

Principles Related to Psychomotor Learning:

Travers (1972, p. 210-13) reviews the theory and research on motor skills learning and arrives at the following summary of principles:

"1. Perceptual-motor skills are complex outputs of behavior involved in performing specific tasks. The performance of these skills generally requires that the individual take in information through his sense organs, and the motor skill represents adjustments to the intake of information.

2. Much of the study of motor skills involves the study of the relationship of human inputs to human outputs.

3. Several stages have been identified in the acquisition of motor skills. In the first phase the learner has to recognize the cues he will later use to guide his behavior and the general characteristic of the equipment used in the performance of the motor skill. Thus, the initial phase is a perceptual phase. The second phase is an action phase in which responses come to be triggered by certain cues. Responses have to become tied, not only to whatever external stimuli trigger them (as when one types a letter of the alphabet after seeing the letter on the printed page), but the responses also have to become coordinated to some extent by the responses that preceded them. In the final stage, the responses become almost automatic and are taken over by the lower centers of the brain, and probably particularly those in the cerebellum.

4. In the learning of many skills, a major task of the learner is to overcome the influence of previously learned skills.

5. One of the few motor skills taught in an educational setting that has been extensively studied is typewriting. The early phase of learning this skill takes place largely informally. Instruction usually begins in what Fitts and Posner refer to as the

second stage. This stage, in the case of typing, is more complicated than that described by these scientists, in that it involves also verbal behavior which forms an important part of the skill in the early stages of learning. In other words, the learner says to himself the letter he is going to type before he types it. At a later stage, the internal verbal behavior drops out. In the final stage the typing of sequences of letters takes place immediately and unhesitatingly in response to the perception of the copy being typed. The typist probably runs off sequences of letters, emitting the proper behavior in sequence. It is doubtful, however, whether the response to one letter becomes the stimulus for the response to the next letter.

6. West proposes that typing should be taught with the use of typewriters on which the letters are printed on the keys, although this has not been done in the past. He also suggests that the emphasis should be on speed rather than accuracy.

7. The laboratory tasks most commonly used for the study of motor skills are tracking tasks. Many of these tasks bear a considerable resemblance to tasks undertaken in daily life, such as driving a car, or copying written material. Tracking tasks may be either pursuit tasks or compensatory tasks. These tasks may be varied systematically in difficulty, often by varying the number of dimensions involved and the number of controls that have to be manipulated. Tracking behavior involves a sequence of decisions followed by actions. In a task involving keeping a pointer in line with a moving dot, the subject will wait until the pointer and the dot become out of alignment and then make a movement to adjust the pointer. The dot and the pointer are kept approximately in line by such sequences of inactivity followed by an adjustive movement. About three such movements per second are commonly made in fast-moving tracking tasks. Tracking behavior is undertaken in small jumps and not in a smooth continuous movement. Supplementary feedback may improve tracking behavior.

8. Perceptual motor skills should be learned in terms of the component skills only when the components do not interact. If the components interact, as they usually do, then the task should be learned as a whole.

9. Performance on most perceptual-motor skills shows a decline after some practice has been undertaken, because of the build-up of inhibitions.

10. The most important single factor with respect to the planning of training in motor skills is control of the rate at which the task is increased in difficulty. The central factor in determining the difficulty of a perceptual-motor task is the rate at which the task provides perceptual information that has to be utilized to perform the task.

11. Some motor skills can be learned, to some degree, through what has been termed mental practice. The extent to which a motor skill can be learned in this way depends upon the extent to which it involves mediating processes. If mental practice is used at all, it should be for very short periods.

12. In the learning of some perceptual-motor skills, knowledge of results or feedback may be delayed for considerable periods, even days, without there being any loss in the resulting learning. Demonstration has some utility in the learning of some skills. The rate at which demonstrations are given is crucial in determining their success.

13. Skills may improve over long periods and there are instances where there have been increments of skill over several years. Even when the person has reached what he believes is his limit of skill, frequent practice is necessary in order for the person to stay at his peak.

14. Stress on the performer is defined as the extent to which he is loaded with, or overloaded with, information from the task itself. Excessive inputs of information to the operator of a piece of equipment produce stress and generally also produce

inefficiency. Examples of the latter kinds of tasks are vigilance tasks. Perceptual-motor tasks are performed at the peak of efficiency, when the task provides neither a very low nor a very high input of information, but an input at the intermediate level.

15. Motor skills involving continous tasks are retained, almost without loss, over a period of many years. Discontinuous tasks are less readily retained, perhaps because they contain more information than continuous tasks, and do not involve as much overlearning.

16. Psychologists have long been interested in the aptitudes involved in the learning of motor skills. Motor ability appears to be fairly complex and involves a number of distinct components. Those that have been identified have been named as reaction time, tapping ability, psychomotor coordination, manual dexterity, finger dexterity, psychomotor precision, steadiness, motor kinesthesis, aiming and abmidexterity."

Summary of Instructional Guidelines for Psychomotor Learning:

Principle	Instructional Guide
1. Attending to the characteristics of the skill and assessing one's own related abilities facilitates the learning of the skill.	1. Analyze the skill in terms of the learner's abilities and developmental level.
2. Observing and imitating a model facilitates initial learning of skilled movements.	2. Demonstrate the correct response.
3. Verbalizing a set of instructions, or a plan, for carrying out a sequence of actions enhances the early phase of skill learning.	3. Guide initial responses verbally and physically.

4. Practicing under desirable conditions facilitates the learning of skills through eliminating errors and strengthening and refining correct responses and form.	4. Arrange for appropriate practice.
5. Securing feedback facilitates skill learning through providing knowledge of results.	5. Provide informational feedback and correct any inadequate demonstrations.
6. Evaluating one's own performance makes possible the continued improvement of skills.	6. Encourage independent evaluation.

Much psychomotor or skill-learning is the learning of new responses or movements. In this connection, the learning of motor skills is much like the learning of language. Both first require making fairly specific responses that the individual has not made before, and then putting these separate responses together into some larger unit. Words are put into phrases and sentences and steps into walking and running. Practice with feedback is essential in learning both language and skills of all kinds.

At all school levels, students may learn to make motor responses, or movements, that they have not made before. The principles given here are stated in such a way as to help the student in learning skills; the parallel instructional tuides outline the external conditions that facilitate skill learning.

Lesson C: Modeling and Observational Learning

Modeling or observational learning is quite often observed in the classroom. Modeling or observational learning is the process of acquiring new responses by imitating or simply observing the behavior of another person. The central premise of this technique is that the complex behaviors to be learned can be developed primarily by a combination of components already available in the student's repetoire.

This study of learning depends on the students' level of attention to the model and on the degree to which the model's performance makes the characterisitcs of the desired behavior highly discriminable. Rainforcement or feedback plays an indirect role in learning largely through the activation of appropriate attentional and mediation processes. A student's performance is influenced by the laws of reinforcement because the student is more likely to perform the new behavior when he is reinforced by doing it.

Much research has been conducted on the acquisition of social rather than cognitive or psychomotor learning. Sullivan (1967) found that viewing of films of adults conserving liquid and substance improved conservation performance of first graders. Modeling procedures were used by McDonald and Allen (1969) to train teachers in skills that combine significant social and cognitive behaviors. They demonstrated that by using video-taped models of effective teaching behaviors they could enhance the acquisition of these in the trainee. The model's effectiveness was greatest when the trainees viewed the video-tape along with the experimenter who pointed out both the appropriate behaviors of the model and the occasions suitable for these behaviors.

Lesson D: Affective Learning

A fourth type of learning is related to emotions, feelings and values that are acquired by the learner. Krathwohl, Bloom, and Masia (1964) worked with a national committee that studied the literature on different kinds of affective behavior (feelings and valuing). These may be noted, in the order of headings from top to bottom, as set forth in the taxonomy of objectives in the affective domain:

1.0. Receiving (Attending)
    1.1. Awareness; e.g., the person is aware of the feelings of others whose activities are of little interest to him.
    1.2. Willingness to receive; e.g., the person listens to others with respect.
    1.3. Controlled or selected attention; e.g., the person is alert to human values and judgments on life as they are recorded in history.

2.0. Responding

- 2.1. Acquiescence in responding; e.g., the person obeys the playground regulations.
- 2.2. Willingness to respond; e.g., the person practices the rules of safety on the playground.
- 2.3. Satisfaction in response; e.g., the person enjoys participating in activities and plays according to the rules.

3.0. Valuing

- 3.1. Acceptance of a value; e.g., the person accepts the importance of social goals in a free society.
- 3.2. Preference for a value; e.g., the person assumes an active role in clarifying the social goals in a free society.
- 3.3. Commitment; e.g., the person is loyal to the social goals of a free society.

4.0. Organizing

- 4.1. Conceptualization of a value; e.g., the person judges the responsibility of society for conserving human resources.
- 4.2. Organization of a value system; e.g., the person develops a plan for conserving human resources.

5.0. Characterization by a Value or Value Complex

5.1. Generalized set; e.g., the person faces facts and conclusions that can be logically drawn from them with a consistent value orientation.

5.2. Characterization; e.g., the person develops a philosophy of life.

(Krathwohl, Bloom, & Masia, 1964).

Some general comments may help in interpreting the taxonomy, which is really a sequence for the development of a value system:

1.0. Receiving (Attending). Internalization begins with the individual becoming aware of something in his environment. After becoming aware he gives it his attention, and, in selective attention, he actually seeks the stimuli. For example, a person is aware of the feelings of others; next, he is willing to listen to others with respect; and then he gives selective attention to discussions of human values. This kind of receiving is the most basic level in the hierarchy.

2.0. Responding. Acquiescence in responding is close to selective attention in that the individual merely complies with the expectations of someone else. Then he willingly responds from inner motivation. At the third level of responding, satisfaction is experienced. The sequence is illustrated by acquiescence to playground regulations, overt practice of them, and then satisfaction in following them.

3.0. Valuing. The next level, valuing, implies increasing internalization. Acceptance of a value, for example, the importance of social goals, does not involve preference. However, preference for a value followed by commitment is exemplified by actively clarifying social goals and becoming loyal to them because one cannot live comfortably with oneself otherwise. Illustrative of the latter level of valuing is the behavior of the dedicated Peace Corps volunteers, religious missionaries, and students who participate in the registration of voters.

4.0. Organizing. As values become more internalized and more abstract, they also embrace more facets of experience. Organization is needed. Before there can be organization, however, conceptualization is required. Values ordinarily are put into words so that they can be manipulated readily in throught.

5.0. Characterization. After conceptualization and organization the individual's behavior is characterized by a value complex, the highest level in the hierarchy. The first behavioral step here is indicated by a generalized set; that is, the individual meets a large number of different situations in his daily life with a fairly consistent method of analyzing and responding to them. For example, when he hears diverse opinions and emotional appeals, he is willing to face facts and draw conclusions logically from them. As groups of organized values are internalized they form the individual's philosophy of life. At a later point in the manual specific teaching strategies will be discussed which deal with affective learning in the classroom.

Unit III Principles and Illustrations of Conditions Which Affect Learning

Objectives:

To identify the conditions which influence the learning process.

To provide illustrations of classroom activities which emphasize these important conditions.

To suggest specific educational guidelines for teachers regarding ways in which these conditions of learning can be applied with optimal success in the classroom.

Activities:

a) Diagnose your own classroom verbal behavior. Using a tape recorder, record part of the school day and then listen to how you teach. If you hear your voice most of the time, it is probable that many of your students stopped listening before you finished lecturing.

b) Try to plan your lessons so that there is group participation. Students can be grouped in committees whose members give lectures in the form of resports while the others participate in discussions following the reports. Here your best role is that of guide and moderator, not lecturer. With younger children, insert small doses of needed information, then question them to get feedback of what they absorbed and whether they achieved the behavioral objectives of the particular lesson. The important goal is for the student to actively participate in any ongoing experience. Sometimes it is difficult to tell whether your pupils are listening; you may mistake a student's intense look for avid attention. However, you know students are listening when there is much individual participation.

c) Incorporate high-interest activities into your lessons. Will all your students find a specific lesson interesting? Probably not, since they have different interests and tastes. Still, there are four tendencies present in most students. First, they enjoy being the center of interest. Second, they are apt to find any subject matter interesting if they feel successful in that area. Third, if a lesson is on a topic they have a special interest in because of a hobby or favorite sport, they will find that lesson also interesting. Finally, most students will find lessons that include a new world of ideas or a new way of doing things interesting because novelty adds a spark of excitement.

Lesson A: Principles Related to Motivation

Motivation is the internal process within learners which functions to arouse, sustain, and direct behavior as well as the intensity of efforts to learn. A teacher does not create motives, rather, they are already present in the learner. The teacher's task is to identify and nurture the unique motives of pupils to determine what drives them, interests them or entices their curiosity about the learning process. Learners must want to learn for whatever reason may be motivating them. Learning does not occur simply by forced repetition of an act or by osmosis resulting from mere exposure to a situation. Something must motivate learners to activate their goal-seeking tendencies. Perhaps a personal interest in the activity or topic because of previous pleasant experiences with it, perhaps they choose to learn to win praise from parents or teachers or to avoid their criticisms; perhaps they seek to out-perform a classmate or to win friends by their accomplishments; these specific conditions which activate a goal-seeking tendency in the learner are generally referred to as motivational conditions. Some principles governing motivation are presented below:

1. Learning increases with increased motivation up to a certain point. This generalization is especially true when one is working on a task well within one's potential ability. Most of the evidence shows some increase in performance with initial increments of motivation.

2. Maximum gain in learning occurs when there is a moderate degree of motivation. Mild forms of motivation result in performance distinctly above that for no motivation, but strong motivation results in performance only a little better than that for mild motivation. In other words, there seems to be negatively accelerated curve of increments in learning for equal increments in motivation.

3. The point at which maximum gain in learning will be reached depends upon: (a) the complexity of the problem, strong motivation having a positive effect on the solution of easy problems and a negative effect on the solution of complex ones; (b) the ability of the learner, motivation having a greater effect on those who have much ability in relation to the task; (c) the degree of concentration of the motivation, that which is presented in a number of small allotments being more effective than that concentrated in a single intense incentive; and (d) the susceptibility of the learner to motivation, that is, one's tolerance for emotional stress.

4. When tension increases beyond the optimal point, learning is disrupted. In some cases the effect

is satiation so that the learner no longer responds to the incentive. In some cases freezing or rigidity or even blocking occurs. In other cases irrelevant actions for tension release take place. In extreme cases agression against others may occur as a form of tension release.

5. An increase in the degree of motivation increases the variability in a group. Individuals differ more widely in their reactions under strong motivation than under mild motivation.

6. In general, moderate levels of motivation result in the greatest efficiency in learning, especially in problem solving. When motivation is very low, the learner is easily diverted by extraneous factors and behavior tends to deteriorate into a series of acts that are not goal-directed. The effect of strong motivation is to decrease the quality of the work done and to increase the activity level. Under intense motivation the learner concentrates narrowly on the goal to the exclusion of features of the situation which are essential to the solution of complex problems. Moderate tension facilitates learning. The most effective motivational level lies somewhere between no motivation and intense motivation.

Instructional Guidelines (Motivational Conditions)

The following are four ways to gain the attention of your students.

1) Change the level of noise dramatically, so that everyone will stop to find out what is happening. For instance, try the magic of silence; if you just stand and look around, there will always be some students who will "shush" the others. Use a low voice to set the tone and then begin your lesson.

2) Try to dramatize. The material may be familiar to you, but it might be an exciting new experience for your group if you present it dramatically--especially in the introductory phase of your lesson.

3) Try a joke or other forms of humor to introduce a concept.

4) Inject a mistake while you are reviewing a particular concept, and see if the students can detect it.

The following are suggestions to promote realistic goal-setting:

1) Avoid over-motivation through too great intensity or too frequent repetition of a given form. Increase motivation gradually. Turn to other motivations before there are signs of disturbance such as turning away from the activity, freezing, excitement, or agression. Discontinue motivation if there is any sign that learning is disrupted.

2) Help students to set their own standards for accomplishment. Avoid imposing goals that are foreign to them. Avoid adding a strong self-imposed motivation, (e.g., threatening to give a quiz; threatening to deprive a privelege).

3) Help students set realistic goals for themselves. Individualize goals wherever possible. Dignify all goals so that each can retain self-respect.

4) Help students meet the goals they have set. Prevent failure by helping in the selection of suitable goals. Build self-respect whatever the achievement may be.

The following suggestions are intended to arouse and sustain interest in the learner:

1) Show your students that you take an interest in them and that they "belong" in your classroom.

Examples:

Learn and use names as fast as you can.

Follow the open school practice of keeping detailed records for individual pupils and refer to accomplishments specifically.

Whenever possible, schedule individual tutorial or interview sessions so that you can interact with all students on a one-to-one basis.

If a student is absent because of an extended illness, send a get-well card signed by the entire class.

To encourage esprit de corps have class planning sessions or have "sharing", that is, invite students at all grade levels to talk about interesting experiences or make appropriate announcements (e.g., discussion of recent athletic, social or political event).

2) Arrange learning experiences so that all students can gain at least a degree of self-esteem.

Examples:

Play down comparisons, encourage self-competition rather than pupil-pupil competition.

Make use of mastery learning.

Permit students to work toward individual goals.

Give individual assistance to slow-learning students.

Don't penalize guessing on exams.

Don't impose restrictions or conditions on assignments if they will act as dampers: for example, "You must hand in all papers typed and with no erasures or strike-overs." Some students may not even start a report under such conditions.

Avoid "do-or-die" situations such as single exams or projects.

To encourage free participation, make it clear that you will not grade students on class recitation.

Point out and demonstrate the values of learning and the limitations and disadvantages ("dangers") of not learning; for example, note that knowing how to multiply and divide is necessary for personal bookkeeping and also that errors will lead to problems and perhaps the necessity to have someone else do the work for you.

Summary of Principles and Guidelines Related to Motivation

Principle	Instructional Guide
1. Attending to a learning task is essential for initiating a learning sequence.	1. Focus student attention on desired objectives.
2. Wishing to achieve control over elements of the environment and to experience success is essential to realistic goal-setting.	2. Utilize the individual's need to achieve and other positive motives.
3. Setting and attaining goals require learning tasks at an appropriate difficulty level; feelings of success on current learning tasks heighten motivation for subsequent tasks; feelings of failure lower motivation for subsequent tasks.	3. Help each student set and attain goals related to the school's educational program.

4. Acquiring information concerning correct or appropriate behaviors and correcting errors are associated with better performance on and more favorable attitudes toward the learning tasks.	4. Provide informative feedback.
5. Observing and imitating a model facilitates the initial acquisition of prosocial behaviors such as self-control, self-reliance, and persistence.	5. Provide real-life and symbolic models.
6. Verbalizing prosocial values and behaviors and reasoning about them provide a conceptual basis for the development of the behaviors.	6. Provide for verbalization and discussion of prosocial values.
7. Expecting to receive a reward for specified behavior or achievement directs and sustains attention and effort toward manifesting the behqvior or achievement. nonreinforcement after a response. Expecting to receive punishment for manifesting undesired behavior may lead to suppression of the behavior, to avoidance or dislike of the situation, or to avoidance and dislike of the punisher.	7. Develop and use a system of rewards as necessary to secure sustained effort and desired conduct. Use punishment as necessary to suppress misconduct.
8. Experiencing high stress and anxiety is associated with low performance, erratic conduct, and personality disorders.	8. Avoid the use of precedures that create temporary high stress or chronic anxiety.

Lesson B: Principles Related to Conditions of Practice or Training

Distribution of Practice

The teacher must frequenly decide whether to go on working with a process until it is mastered. If the process is to be broken, at what point should the break occur? What should be done during the rest period when reminiscence is presumably occuring? How often and for how long should the teacher provide for overlearning? A spelling word is mastered one day; the teacher must decide whether to introduce it again and if so, when. The same dilemna occurs in teaching word recognition, arithmetic facts, industrial arts skills, and other learning processes.

Instructional Guidelines (Massed vs. distributed practice):

1. Distributed (spaced) practice is generally superior to massed (crammed) practice. The advantage of distributed practice is greatest in delayed recall. The reminiscence effect is a temporary phenomenon, affecting immediate rather than delayed recall, and that the effect of overlearning is greatest in permanent retention. If the learner pauses for a little while, then reviews the material again, he has the advantage of both processes. This may be the result of the effect of differential forgetting during rest, promotion of learning during rest, or more persistent

motivation and higher morale in distributed learning. There seems to be a rhythm, alternation, or periodicity of action to which distributed practice conforms and which makes it superior.

2. Practice periods of decreasing length and rest periods of increasing length represent optimal distribution. Bringing the material to attention repeatedly is more important than holding it in attention for long periods of time.

As for the rest periods, they should be of medium duration since periods that are too short do not permit reminiscence or forgetting to take place, and those that are too long have no advantage since the greatest forgetting and reminiscence take place just after learning stops. The best point at which to introduce the first rest period corresponds to the point at which reminiscence becomes effective, somewhere between the point at which learning is half complete and where it is just complete.

In any event, the length of practice period and length of rest period must be adjusted to each other. In the most effective schedule, the periods are first long and close together and then become increasingly short and widely spread.

3. The minimum length of practice period depends upon the nature of the material being learned. Materials that are highly structured and meaningful, and are approached in a logical manner, can profit from more massing than material that is relatively meaningless. Where there are large elements of discovery, as in problem-solving, and where variability of attack in the early stages of learning is important, the initial units may also be relatively long; on the other hand, when the learning is routine or drill in nature, long and difficult, presented rapidly, or where the learner is limited in ability, distributed learning is superior to massed learning. In other words, distribution of practice is particularly important for learning that is difficult and tedious.

Instructional Guidelines (Whole vs Part Learning)

This issue refers to whether it is preferable to learn a unit of material as a whole in its entirety or to lean component parts or sub-divisions of the material separately. If the material is unified, functional, and consists of a meaningful unit, learning it as a whole is generally recommended. For example, a poem which contains a single thought or is narrative in nature is probably best learned in whole. For some tasks, effective performance will require a mastery of separate parts of the task which must precede putting them together as a functional activity. For example, in performing a complex machine operation it is very often necessary to break it down into its component parts to learn it. When the separate actions are learned they are put together to make a total performance.

Specific guidelines are listed below:

1. Learning should be undertaken by using the largest units that are meaningful and within the capacity of the learner.

2. Becoming familiar with the overall organization, or previewing the total operation, will help to make the learning of contributing parts more effective.

3. Some form of part method is usually preferred by the learner. The smaller unit requires less initial effort for learning. In addition, the learner experiences a feeling of success each time he masters a part, and the total of the success experiences for many parts is greater than the single feeling of success he achieves in working from the beginning with the wh9le material. Part learning shows rapid initial learning of the parts themselves, but does not transfer to the whole.

4. Where the unit is structured but overcomplex for the learner, it is best to present the major outline, then isolate one part for attention, then fit it back into the unit within the same learning situation. If the learning must ultimately be used in the context of the whole, too complete learning of parts may inhibit later learning of the whole; part learning does not transfer automatically to the whole. It is well to begin by doing the thing in the way in which it is eventually to be done, but in major outline uncomplicated by too many details; then to isolate each part for special attention; then to link the parts back to the whole structure.

The learner himself should help in structuring and organizing the materials, selecting problems and evolving plans, solution and evaluation. If he gains the idea of the pattern of the whole, he will fill in the appropriate parts. For example, a student in writing s story needs a word he cannot spell; the teacher shows him how to write it; he uses it and goes on with the story. Later he places that word on his spelling list and studies it: isolation of the part is helpful in mastery. Still later he needs the word again in writing stories, and either recalls or looks it up and writes it again until he recalls it.

Summarized Suggestions:

When to use the whole method. In sum, the whole method of teaching is probably better when

1. You want to give a global picture of something without paying particular attention to details. Encouraging students to scan a book, read only only chapter summaries and occasional paragraphs, is an illustration of this process.
2. Your students have above-average IQs.
3. The material is meaningful and more concrete than abstract.
4. The material is closely knit together on one theme, and not too long.

When to use the part method. The part method of teaching is better when

1. A student is not very capable intellectually. For example, slow learners need to learn new material a step at a time because of the intellectual difficulty they may have in seeing the "whole" picture. Students need the reward and encouragement they can receive more frequently when learning smaller subunits of material. The whole method can be more discouraging because some students have to work too long before they see any return for their efforts.
2. The material is long, complicated, and lacking a central theme.

Lesson C: Principles Related to Group vs Individual Learning and Competition vs Cooperation

Group vs Individual Learning: Information and Suggestions

1. Working in a group generally stimulates

stimulates individual output. This stimulation occurs whether or not there is interaction between members of the group, though it is intensified with interaction. The learner shows greater speed, though the work tends to be of the same quality as that done alone. There is a heightened activity level, and perhaps an unconscious competitive attitude. The increase is greater in routine tasks, though it is present to some extent in such activities as problem solving.

How well an individual performs in a group is related to social status, both actual and perceived. Social responses from teacher or classmates, even nodding the head or listening attentively, can improve individual output, especially when the student has had little prior attention.

2. Attitudes toward work done under social stimulation are more favorable than attitudes toward work done alone. When one has worked with others on a task, one is more likely to continue to work on it when alone. When a classmate is introduced, the learner may be drawn back to a task in which interest had been lost earlier.

3. Group action affects the quality rather than the quantity of work done. Its effect is opposite to that of competition or an audience. Its benefits are greatest in solving difficult problems requiring insight and originality, not in routine tasks. For example, a group will

be better able than an individual to handle a problem of behavior or a controversial issue; but group work will have little advantage in arithmetic drill or simple construction. The group takes longer to reach a decision and longer to recall and use experience, but given plenty of time it makes more effective decisions than the individual. It also recalls and uses material more completely.

4. The group is influenced more by the better-informed members than by those who are poorly informed. This observation holds no matter how enthusiastic or dominant the poorly informed may be, provided the task is clearly structured and within the comprehension of the membership. Only if the task is ambiguous or too difficult for the group will the members turn to those whose enthusiasm makes them seem to be informed. Older learners influence a group more, and younger students are more subject to group pressures, a relationship which is a product of mental development and social experience. It is doubtful whether pupils are ready for much formal team work before the age of nine or ten. Relatively bright individuals influence the group more than the less bright, because they have more information available and are able to use it more flexibly.

5. Individual participants in group work learn more than individuals of equal ability working alone. This

difference is in part due to social facilitation and in part to the increased flow of ideas. The gain carries over to individual work done following group work. Once a group judgement is made, it tends to be fixed and to affect later individual behavior. The chief exception is that the most able students have a chahce to work with other able students in order to experience the stimulating effect of group work. If they are always the most able, they develop an aversion to group work.

6. Work done by a group is distinctly superior to that done by the average member of the group, and equal to that of the best member. The effect of group work is not averaging but an additive one so far as the job done is concerned. There is a gain with the addition of each member. The degree to which work will be better than that of the same individuals working alone depends on how much more able the best members are than the average of the group. For example, a decision on a rating worked out in conference is more accurate than that made by the same persons working individually and averaging their independent ratings. The gain may be due to the increased range of information present in a group, the varied interpretations of facts, the scattering of errors, the testing of idea by

others, the more critical attitude with which the individaul approaches group work, and the fact that the group fress the individual from personal threat and increases one's willingness to try new ideas.

7. Only in an interacting group are the benefits of group work felt. For group work to be effective, each individual must be aware of the underlying motivations of the others, and want others to reach their goals as well. The group must work together toward mutually defined solutions. If the group is simply an aggregate of individuals without interaction, there will be little gain.

Competition vs Cooperation; Information and Suggestions:

Competition is a potent incentive under certain conditions but can be destructive under others. It is not stimulating to either the winner or the loser to compete out of his class. Competitors should have some chance of winning; competition should involve a degree of equality among contestants. Even when there is some equality of competitors, teachers should stress friendly rivalry rather than rivalry that breeds interpersonal antagonism. There are three kinds of effective competition.

1. Interpersonal competition among peers often encourages spritied rivalry.

2. Group competition where each member can make a contribution and is involved in the group's success is a strong motivator.

3. Competition with oneself, with one's previous record, can be effective and is recommended.

Depending somewhat on how it is managed by teachers, competition may stimulate effort on the part of those who seek esteem and see in competition a chance to get it. Competitors who are weak in the area concerned will have both their safety and esteem needs denied. It has been found that gaining high scores on tests may be stimulated by both competition and cooperation. Competition provides excellent opportunities for learning to adjust to social realities and hence to the gaining of esteem and belongingness. Cooperation, involving skills from many pupils, merits more frequent emphasis because the outcomes are more closely in accord with the stated purposes of education and our dominant social philosophy.

The following principles or facts summarize much of what has been determined from research on the effects of competition and cooperation:

1. Interpersonal competition among peers often encourages spirited rivalry.

2. Group competition where each member can make a contribution and is involved in the group's success is a strong motivator.

3. Competition with oneself, with one's previous record, can be effective and is recommended.

4. Competition increases the amount of work done, but quality remains the same or deteriorates. There is improvement with competition in simple mechancial tasks, but work on more difficult tasks is inhibited.

5. The more personal the competition, the greater its effect. Students generally prefer competition against theri own records, and work under such conditions is as good as that done in competition against others. For older students, competition against another individual is superior to competition against a group.

6. For the learner to be motivated, he must think he has a good chance of success in competition. When he thinks he has no chance of winning, either because he has usually failed or because he knows his competitor is a champion, his attitude causes failure behavior. There is inhibition of overt response, lack of confidence, and physical tension growing out of the deflection of energy from thinking to feeling. Giving the learner a handicap based on his previous record, however, permits him to feel that he might succeed, and increases the sureness of his learning and the energy he puts into the task.

7. Older students respond more to competition than do younger ones. The reason is the decreasing social awareness that comes with age, combined with the home and school pressures that foster competitive attitudes. The critical period for the emergence of competition is from ages four to six. By the time the child enters the elementary school he is already responding to competitive stimuli, both those specifically imposed and those implicit in our culture.

8. Average or slow learners respond more favorably to competition than do rapid ones. Competition inhibits the performance of the rapid learner; he is more likely to have and respond to intrinsic or internalized standards where the average student develops internalized standards more slowly and hence, is more influenced by socially imposed demands. The rapid learner is more

likely to think for himself and have highly individualized interests, goals, and conduct norms; the average student is more likely to be responsive primarily to social demands. The pressure of the culture is always toward conformity to the average in behavior. The less able learner has an upward pressure operating, one which raises his performance in relation to the social group; the more able learner feels a downward pressure from the same stimulation, a pressure that scales his performance toward the average even though his own way of doing things may be better. The pressure of social forms of motivation is a leveling one, in which the more able learner gains less than the others. In addition, the bright student is more perceptive of the pressures in his environment, so that any pressure may easily become over-motivation for him. It is important to remember that the chief gain in competition lies in speed of performance, with no gain in quality of work. It is in quality of work that the rapid learner needs stimulation and then will respond favorably.

9. Cooperation may or may not be less effective than competition. Results are inconclusive, depending on the type of task or goal. The learner is more highly motivated by work for self than by work for the group, although with experience in group work one comes to respond equally to the two forms of motivation. The balance that team rivalry provides between cooperation within the group and competition against another group combines the effectiveness of work for self with the social gains of work for the group.

10. The quality of interpersonal relations under cooperation is positive, that under competition is usually negative. Individual reward under competition is associated with increased variability of behavior, attacks on others, and increased speed of work without cooresponding increased quality. Cooperation, on the other hand, leads to positive responses toward others, social freedom, group identification, greater interdependence of behavior, and in general more socialized forms of behavior. Cooperation seems to have a more lasting effect than competition.

11. Groups that work best together are relatively small, homogeneous, self-chosen, and familiar. Those who have something in common can understand each other better, whether the common factor is an interest in building a store or the ability to read. Learners of the same sex work together better than those of opposite sex. Groups in which the individual chooses to work with certain others cooperate more easily than those which the teacher assigns, or even those in which the chairman chooses the participants. Groups of individuals who know and like each other accomplish more work than those that disregard such spontaneous choices.

12. Cooperation is a more advanced stage of social development than competition. It occurs more often among older students than among younger ones. It ocuurs only as the result of training, however. It is particularly important for teachers to aid the development of cooperation.

ILLUSTRATION OF CONSTRUCTIVE COMPETITION IN THE CLASSROOM

One vocational education instructor has a knack for turning otherwise routine auto mechanics class into an interesting contest in which all students have a chance of experiencing success. The activity proceeds very simply by dividing the class into two approximately equal teams. The team tasks usually involve assembling engine components (such as a carburator or cooling system) or replacing parts. Competition is between teams and against the clock. No team member is ever eliminated, and the pressure is reduced considerably. There are no prizes or other material rewards for winning--just the team spirit and whatever naturally good feeling might accompany it.

Another teacher at the elementary level arranges simulated quiz programs, which are usually conducted during those times when material is being reviewed for, say, an examination. Equal sides are chosen and each side gets so many points for a right answer to the "quizmaster," as the teacher is called. Students who may be a bit slower are asked somewhat easier questions so that, again, everyone has an opportunity for success. A variation of both of these games is to have groups of at least three students work together so that each "team" is actually composed of perhaps four groups of three students. Thus, within a modified competitive framework, students can also have the experience of cooperating together.

ILLUSTRATIONS OF DESTRUCTIVE COMPETITION IN THE CLASSROOM

Dealing wisely with individual differences means, first of all, recognizing the destructive effects of competition when it is misued. Examples of destructive competition are endless (unfortunate, this), and what follows are three actual examples to give you a better feel for what we mean by this kind of competition.

1. A fifth-grade science teacher had each of her thirty-one students read his most recent test score aloud in class so that she could record that score and its corresponding grade in her grading book. On top of that, she announced out loud the grade equivalent of

each score. Very rewarding for the top students. Very sad (and punishing) for the bottom students. Destructive competition at its worst--if you don't do well, the whole class knows.

2. A high school history teacher posts the grades of his exams by name, score, and letter grade on his classroom door, which, as he says, "lets the kids know how they're doing and gets the low scorers off their fannys." This may be fine in some cases, but what of the low scorers who did the best they could? Besides, why should one's performance in history class become a topic of invidious comparison and idle social conversation, particularly among high school students who are not particularly noted for merciful judgments of each other?

3. A junior high English instructor hands back both exams and term papers in chronological grade order, announces the grade associated with each new grade category, and then calls students one at a time to retrieve their papers. Again, a primitive reward-punishment system in action.

Approaches such as the above are destructive for the following reasons (you may think of others):

1. Learning gets de-emphasized because the primary goal is to be better than others. Thus, learning is seen as a means to an end, not as an end in itself. (Who cares about learning when survival is at stake?)

2. Only a few students can feel satisfed and rewarded. Public disapproval or failure is many times worse than that experienced privately because now one has to be concerned not only about his lack of performance, but his possible loss of approval and acceptance as well. It's difficult enough to improve one's effort without having his social image to worry about, too.

3. When performance is consistently reported in terms of relative position, what frequently happens is that for many students quality deteriorates, experimentation and risk taking decrease because of the fear of failure, and general improvement is discouraged. Remember,

there can be little, if any, improvement if one does not try and experience some success in doing those things he thought he couldn't do.

Now then, how can we make competition more positive and constructive?

Suggestions and Guidelines for Constructive Competition in the Classroom:

The very nature of competition means someone wins and someone loses. There are, however, some ways of reducing the sting of losing without diluting the healthy features of competition. For example:

1. Encourage each student to compete against himself as much as possible. On a term paper a teacher may write, "Pretty good work here, Dan, perhaps next time you can write a stronger concluding statement." Or another teacher may write on a C+ exam, "This is not at all bad, Alice. Im pleased with your effort. Let's see if you can top this next time." In these instances we're not requested to match the record of the brightest student in class, but challenged only to beat our own previous performance. True, both the term paper and exam were graded competitively against the whole class, but the emphasis is on how the student can top himself--that's the difference.

2. Keep grades confidential. The implications of this should be self-evident. How a student does--at any level--is his own business. It should be his choice to divulge his grades, not the teacher's.

3. Try to give every student a chance for success by arranging situations and recognizing experiences in which different students of different abilities can be acknowledged for their best efforts. Ways for doing this might include putting up examples of not just the best idea or content papers but the neatest papers and the best organized papers. In addition, a teacher

could make a special effort to recognize behavior such as punctuality and dependability and by giving special acknowledgement for skill in arts and crafts, special interests, music, and hobbies. If a student knows for sure that there are some things he can do pretty well and that are appreciated, the things he can't do so well may not be so devastating to his ego.

Lesson D: Principles Related to Transfer of Training

Most educators believe that promoting transfer of learning is one of the crucial purposes of instruction. Transfer refers to the degree to which learning a given task will generalize or carry over to the performance in the same general class of tasks but in new or different situations. Good teaching always involves teaching for transfer. It is another way of saying that good teachers have a definite objective of making learned material a functioning part of the youngster's response system. It is thus essential that teachers think through their own subject matter and study the generalizations, relationships, and methods that may transfer. The extent to which students learn how to transfer will depend on how well teachers can lead students to see the similarities between the subject matter and its applications.

Positive and negative aspects of transfer. Transfer can be either negative or positive. In the case of positive transfer, the previous learning is likely to facilitate and enhance subsequent learning. For example:

A student learns 5 X 4 = 20
This should help him learn 4 X 5 = 20
And, further 50 X 40 = 2,000

Another illustration of positive transfer is reflected in the considerable success experienced by driver education students as they make the transition from the drive education car to the family car.

Negative transfer occurs then previous learning interferes with learning something new. For example, the T-formation high school quarterback may have trouble adapting to the wishbone formation of his college team; parents who learned to do math the "old" way invariably experience trouble with their children's "new" math; learning the rules for driving on the right-hand side of the road in the United States presents trouble for the sightseeing American who rents a car in a country where driving is on the left side of the road, and so on.

More generally, transfer from one activity to another contains both negative and positive aspects. For example, many of the skills of handball are sufficiently similar to those in paddleball that a person learning to play paddleball may be helped by his previous experience with handball. At the same time, there are also skills involved in each that are sufficiently incompatible to make it necessary for him to readjust his old skills (learnings) before he can get on with the new one.

Suggestions and Instructional Guidelines for Promoting Transfer

1. Strive for similarity between in-school learning and out-of-school experiences.

Make situations discussed and activities conducted in the classroom as similar as possible to those which the student encounters outside it.

Examples: In business classes make the classroom as much like an office as possible. In auto shop make the class as much like a garage as possible. Use student body and class elections to teach students how to function as voting citizens. This is a principle that coaches are very skilled in applying. A football coach, for example, knows that the best play diagramming in the world is practically useless information until his players have an opportunity to execute those plays on the practice field. He knows, further, that those plays are even more likely to transfer from the board to the actual game as the players have an opportunity to execute them in scrimmage under game-like conditions. So, too, does the wise band director recognize that his intricate marching patterns are more likely to be performed correctly by his high-stepping musicians if they had a chance to practice them on a marked field prior to the half-time show.

2. Develop meaningful generalizations.

Each classroom topic can be thought of as something to be learned in itself or as an illustration of a broad principle. One may memorize Caesar's biography, or one may observe in it the consequences of concentrated power. One may learn how the gasoline engine operates, or one may derive from it principles applicable to all thermo-dynamic systems. One may do an arithmetic problem, or one may learn from it a general plan for all problem-solving. These broader principales make a specific type of learning most widely transferable. It is not enough, however, to present generalizations. They must be understood by the learner, not merely parroted. Retention and transfer are more apt to occur if the content a student is learning is meaningful to him or if he can understand the basic principles involved. It is one thing to know that 4 + 4 = 8, but it is another to know why it does. In other words, concentrate on the process of learning as well as on products. Do not be satisfied with a right answer or solution, but probe to find out why a certain answer was given, and discuss with the class the steps that led to their answers.

3. Use varied and relevant teaching materials.

Work with materials which are similar to those to which the learning is expected to transfer. Beyond merely pointing out situations to which learning may transfer, the teacher should base the classroom work on life-like materials whenever possible. The more a pupil experiences the real situation, the more likely he is to recognize his next opportunity to respond to it. This principle is illustrated in the gradual reduction of verbalism in the schools, exercises with words being replaced by exercises with objects, charts, and motion pictures. The experience of conducting a student-body election has more in common with the experience of a citizen than does memorizing the life history of a bill introduced in Congress. The class which experiments on white rats learns more about the effect of nutrition on growth than the class which merely learns the verbal principles.

4. Provide practice in transfer.

It is not enough to point out relationships. Pupils should be given practice in finding relationships on their own. Tests of application, guided discussion, and actual class projects ought to provide this kind of experience. In other words, provide practice in applying the generalization. As essential stage in transfer is recognizing a new situation as a special case of an old type. One cannot practice such recognition simply by drilling on a page of exercises. Practice is obtained by encountering a new situation in a setting which does not carry a sign identifying the generalization to be used. Some of the best experiences for transfer come through encountering algebra in the science text or science in the home economics project. Any teacher can set up transfer experiences by introducing problems calling for application of generalizations in a context which forces the student to decide for himself what procedures or principles apply.

5. Teach for transfer.

Use methods of teaching (for example, problem solving, discussion, leading questions) that will facilitate transfer. Positive transfer is more likely to occur when there is conscious teaching for transfer. Transfer is not automatic. For transfer, the material must be taught not as a specific, but for broader use. Wide experience and factual knowledge do not assure transfer. Transfer is the result of conscious effort, of conscious generalization and application while learning.

Transfer is favored by a learning set directed

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toward classification generalization, relationships, and position within a logical learning structure. It is much less likely to occur when generalization is undirected, and when the relationship to other learning is a mechanical one.

The teacher may aid transfer by suggesting that certain experiences may be useful, proposing a method of study, providing knowledge of related fields, encouraging the development of skill in manipulating ideas, stimulating systematic questioning of the evidence, teaching the ability to apply statistical analysis and interference, and making the individual aware of methods one might use. The ability to organize materials and methods to promote the maximum degree of positive transfer is the mark of a superior teacher. The learner will transfer to some extent on his own initiative when two situations are highly similar, but conscious teaching for transfer will make it possible for the individual to apply his learning more widely through analysis of similarities between the old and the new. Ability to transfer is an important factor in perception, insight, reasoning and originality.

Point out the possibility of transfer to real life situations. If pupils expect that what they learn will help in later situations, they are most likely to use it when opportunity arises. The teacher can introduce specific materials illustrating life situations where the principles of the school subject are applicable: shortcut calculations based on algebra, hidden assumptions in the reasoning of advertisements for comparison with geometric postulates, and habits of dental care as an application of knowledge about bacteria. Instances of confusingly similar situations may be specifically pointed out to reduce negative transfer.

Additional brief suggestions for teaching for transfer.

1. Have clear-cut objectives. Decide what students should be able to do as a result of their work.
2. Study the course content to find what it contains that is applicable to other school subjects and to out-of-school life. Relate teaching to students' own personal backgrounds, experiences and interests.
3. Select instructional materials that are best suited to the job of making relationships apparent.
4. Let students know when to expect transfer, what kinds to expect, and the benefits it can bring them.
5. Bolster whatever is being learned with a variety of examples presented, if possible, in various settings or contexts. Provide for early success during training so favorable attitudes will be carried over into later uses of a particular skill or competency.
6. Help students discover personal meaning in a task or skill that is being taught. Meaningfulness has been identified as one of the most important (if not the most important) condition for effective learning.

Lesson E: Principles Related to Feedback, Reinforcement and Success or Failure.

Feedback and Knowledge of Results:

The principle here can be simply stated: We are more likely to avoid mistakes and improve performance if we know what our mistakes are in the first place. Hence, it is important to students that we indicate to them not only what was wrong, but why. In addition, the time span should be as short as possible between, for example, handing in a paper or writing an exam and feedback about the results. Nothing stifles motivation and encourages loss of retention more effectively than to have to wait two or three weeks to get a quiz or a paper back. Even worse is the experience of having to wait two or three weeks and receive no more feedback than a cold, impersonal grade in the upper-right hand corner.

Knowledge of results leads to improved achievement and greater retention for at least five reasons: (1) it tends to encourage repetition of those things we're successful at, (2) it helps us correct or improve incorrect or unsuccessful responses, (3) it provides an incentive to perform as accurately as possible, while lack of such knowledge reduces the incentive, (4) it helps to capitalize on what has been called the "law of increasing energy," which states that the closer one gets to his goal, the greater the effort he puts forth. Thus, it is usually easier, as most of us have discovered, to write the last two pages of a term report, than the first five. (5) Knowledge of results also has the effect of introducing intermediate, short-term goals in addition to the ultimate and final goal--thus providing a more frequent resurgence of new energy.

Instructional Guidelines: Feedback

1. Practice without knowledge of results brings little or no improvement. In the beginning, there may be some increase in motor adaptation in a simple skill, but no sustained progress is apparent. There is slight evidence of latent learning, that is, of improvement which shows up under motivation after initial learning is completed. For the most part, practice is only a time framework within which other factors may operate; practice alone accomplishes little.

2. Knowledge of results brings marked improvement in performance. Evaluation is not merely a method of measuring teaching out-comes but is also an integral part of the teaching process itself. When a student is given knowledge of results after working without knowledge of his progress, his learning curve shows a decided upward trend.

3. The more detailed and specific the knowledge of results, the greater the progress. The learner needs to know not only whether he has achieved his goal but also how far from the goal he was and in what direction he deviated. Evaluation should be specific. Partial knowledge is better than no knowledge at all, but full knowledge is most effective.

4. The more positive the knowledge of results, the greater the progress. The reason for this conclusion may lie in the fact that knowing a given response is right is more specific than knowing a particular answer is wrong. Pointing out errors is less effective than pointing out correct responses, especially where the emotional content in the learning is moderate and any hint of punishment or reward is avoided. The effect of emphasizing the right response is that the learner's errors drop out. The effect of emphasizing errors is that he still makes them but turns back quickly, a more roundabout method of meeting the situation. Pointing out errors makes the child remember the error but not its correction.

5. Immediate knowledge of results is superior to delayed knowledge. And the superior performance gained under knowledge of results persists after the giving of objective information is stopped.

6. Classes and individuals differ in the way in which they respond to knowledge of results. Young children seem to be affected more than older. Better students are affected most, wheras poor students are affected little. The degree of effectivenssof any incentive varies with the learner's estimate of his possibility of success in that situation. Further, the level of interest for the particular learner and the particular activity will affect the amount of gain from information about results.

The implication of these principles for teaching is that if we wish to promote effective learning, knowledge of results should be introduced as quickly as possible and in as specific a form as possible. This fact probably largely explains both the efficiency of individual instruction and the inadequacy of imprecise letter and number grades. The information given, however, must be relevant to some motive of the student.

Instructional Guidelines: Reinforcement

1. Behaviors which are rewarded (reinforced) are more likely to be emitted.

2. Sheer repetition without indications of improvement or any kind of reinforcement is a poor way to attempt to learn.

3. **Threat and punishment have variable and uncertain effects upon learning; they may make the punished response more likely or less likely to recur; they may set up avoidance tendencies which prevent further learning.**

4. Reward (reinforcement), to be most effective in learning, must follow almost immediately after the desired behavior and be clearly connected with that behavior in the mind of the learner. It is generally found that positive reinforcements (rewards, successes) are to be preferred to negative reinforcements (punishments, failures).

5. Association with some kind of feeling tone, whether pleasant or unpleasant, aids learning and recall. It is the emotionally colorless experience that is most difficult to remember, both immediately and later on. Both positive and negative reinforcement facilitate remembering. If a skill or attitude or other learning is to become permanent, some comment or some consequence with emotional overtones is desirable. The least favorable condition for remembering is to have an action ignored. The presence of emotion helps to isolate the learning cues. It is better for the teacher to say something than to say nothing if she wishes the child to learn from his experience.

6. Conversely, ignoring a response helps the learner to forget it. Sometimes the forgetting is what the teacher wants. If the student makes a mistake, whether in spelling or in playgound behavior, a neutral or indifferent response or no reaction at all is the best way to avoid recurrence of acts that are not habitual. The teacher should ignore the behavior she wants the individual to forget.

7. Negative forms of reinforcement should be used only for learnings the teacher wants the student to remember to avoid, not for those she wants him to forget. There are occasionaly dangerous acts, or fixed habits that the teacher must bring to attention in order that they be eliminated. This need applies to relatively few situations during the initial stages of learning.

The learner may respond to negative reinforcement by learning not to give a punished response, or by learning to do something to avoid the school situation. The danger is using frequent or intense negative reinforcement is that the anxiety it produces is likely to generalize to related parts of the learning situations which the teacher does not want the learner to avoid; for example, too much reproof for poor handwriting may make the learner avoid all forms of written expression. Negative reinforcement generalizes more widely than positive forms.

8. In the long run, positive forms of reinforcement facilitate learning more than negative forms. When praise is repeated a number of times, the learning increases for an initial series of trials, then levels off, eventually the learner becomes accustomed to or dependent upon praise to maintain his own feeling of self-worth. With reprimand or failure, learning is increased immediately but falls off very soon and very rapidly; failure does not maintain its effect in stimulating learning as long or as well as praise.

9. Pronounced differences in attitude occur under positive and negative forms of reinforcement. When the pupil feels he is succeeding, time seems short, the task seems easy, he enjoys what he is doing, and he is more likely to resume work after interruption. When he feels that he is failing, time seems long, the task seems difficult, he dislikes what he is doing, and he is less likely to come back to the task. When succeeding, there is an increased activity level, greater effectiveness of work, more recall of related material, more language expression, and a longer period devoted to the initial effort. When he is failing, he becomes passive, forgets related things, and tires quickly. Students seek again those experiences in which they have succeeded and avoid those in which they have failed, but they remember both.

10. Both positive and negative reinforcement are most effective when attached to specific acts rather than to diffuse situations. This difference is, in part, due to the stronger focusing of the motivation on the behavior in question.

11. Symbolic forms of reinforcement are effective, though non-verbal forms are more effective than verbal forms. Actual success is superior to praise by the teacher, perhaps because the success communicates more effectively a feeling of self-worth than does a comment from an adult. Arranging situations in which the learner can succeed, and permitting him to experience the normal consequences of acts in which the teacher feels he has failed, are the most effective forms of motivation.

12. Both positive and negative forms of reinforcement are best used immediately after or as part of the learning experience itself. Delayed praise or reprimand, unless they are anticipated, will have relatively less effect on learning than either given immediately. An anticipated reward is about as effective as a reward given immediately,but threatened punishment is less effective then immediate negative reinforcement. The effect of the delay follows the same pattern as that for repeated use of the reinforcer; that is, the positive form maintains its effectiveness longer than the negative.

13. Both pleasant and unpleasant feeling tone recede toward a neutral value with the passage of time. The process of forgetting, or overlaying old experiences with new ones, operates in feeling tone as it does in more largely intellectual areas. But what we recall as pleasant in meaning is sometimes different from what we experienced as pleasant in feeling at the time. An operation or an accident may have been an unpleasant as an experience, but recalling our fortitude or heroism at the time may be highly pleasant. There is some indication that over long time intervals we avoid recalling unpleasant experiences that remain unpleasant to recall, but retain the ability to recall pleasant experiences that are pleasant to recall.

14. Both positive and negative forms of reinforcement are best used in moderation, and with frequent shifting in specific form. Any form loses its value if repeated often. The balance, however, should be on the positive side in the long run in order to help the pupil maintain his self-respect and a feeling of adequacy.

15. Individual differences in reaction to positive and negative reinforcement are significant. Negative forms are felt earlier than pleasant. Bright students and those whose initial standing is high can respond more constructively to negative forms than slow-learning ones; the slow-learning need constant praise and they respond to rewards in a relatively greater degree than do the bright. Boys seem to be able to respond to negative forms more constructively than girls, perhaps because our culture protects girls. Older children respond to both positive and negative reinforcement more strongly than younger children, and are able to use negative forms more constructively. Praise is especially important in the preschool and primary years. Well-adjusted children have histories in which positive forms of reinforcement have pre-dominated, while poorly adjusted children have had a high proportion of negative reinforcement, creating insecurity. Introverts respond best to praise, particularly to continue praise; extroverts can use reprimand constructively. Some teachers, and all teachers in some situations, can use praise more effectively than reprimand; for others the situation is reversed.

Success and Failure:

Success is often an end in itself. It is a type of reward. Both success and failure promote learning. If failure comes too soon or too frequently, the learner may become discouraged. His negative attitudes and discouragement may lead to emotional disturbance. All of these may interfere with his learning. If he sees himself as likely to fail, this view of himself must be altered before he is motivated to learn. Ordinarily we use our failures to improve our performance. When goals are attainable and clearly defined, success is more probable.

Studies of the effect of failure seem to show that filaure is not comparable to success in the sense of being its opposite but that instead, the effects of failure differ in quality. Specifically:

1. Failure depresses the action potential. Muscular action normally accompanies attempted solution of problems. There is usually a decreased motility level under failure. Sometimes there is speeding up to relieve tension at the expense of efficiency of work. Sometimes "sparking-over" to activities not directed to learning occurs.

2. Failure slows learning. It decreases the number of correct responses and increases the time taken to give them. It results in apathy or depressed psychological functioning as a defense against complete awareness of failure. It means a decreased sensitivity to potentially disturbing stimuli, both internal and external.

3. Failure causes a moving away from reality. Quitting, day-dreaming, and regression are common. Social responsiveness is reduced. Work is dogged and ineffectual. The task also is decontextualized, or split off from its social frame of reference.

4. Failure causes persistent nonadjustive behavior, and tends to fix incorrect response patterns. Frequent punishment of the wrong response is more likely to cause the response to occur again than to eliminate it. This response is especially probable if the pupil knows he is wrong but does not know what is right. Reprimand also strengthens the response by serving as an informative signal.

5. Failure increases the variability of behavior. Some students show aggression, others regression, some respond with skepticism and some with panic. Some do the same thing over and over mechanically; others "freeze." The effect of failure seems to be intensified whatever response pattern is dominant in the pupil at the moment. Individual differences increase under failure, decrease with success.

6. The effect of failure is cumulative. We have already noted that repeated failure is damaging, and that anticipated failure interferes with learning. There is greater danger of over-motivation and disruption of learning in failure than in success.

7. Failure causes changes in attitudes as well as in ability to remember. It shortens the pupil's time perspective, makes him think of the minutes spent in learning as long, of the learning as difficult and unpleasant. It makes him forget related material he previously knew. The relation of these facts to non-promotion is of interest.

8. Training can correct these ineffective behaviors by introducing progressively more difficult tasks in which the child succeeds. With success comes interest, self-direction, and elimination of non-adjustive behavior. For example, trial promotions result in as much learning as non-promotions, and grades in new subjects tend to be higher than those in repeated subjects.

Unit IV Principles and Illustrations of Teaching Functions and Instructional Strategies

Objectives:

To list and discuss some of the functions of teaching;

To provide illustrations of various instructional strategies and techniques as applied to specific classroom situations;

To suggest instructional guidelines for teaching practices.

Suggested Activities:

1. Identify the various roles a teacher must assume in fulfilling his or her responsibilities to the learner.

2. Observe different teachers in various classroom situations to identify differences in teaching styles.

3. Have pupils role-play teacher roles - set up hypothetical situations in which the students can assume the responsibilities of the teacher.

4. Use one coffee-break a week for material sharing and technique demonstrations.

Information:

Some important functions of teaching.

1. One very important aspect of the total teaching performance is associated with informing and explaining.

2. The tasks of a teacher involve showing how. New skills and techniques are often taught in this manner.

3. The existing curriculum and supplies are never completely adequate for every child. Teaching involves supplementing the existing curriculum.

4. In our society another requirement of teaching is to provide opportunities for children to think and share their thinking with each other.

5. The teacher is expected to guide the development of values. A function of teaching, then, is to provide choices which involve value judgments and give the children opportunities to clarify values and share valuing with each other.

6. The teacher is expected to relate the life of the community to the work of the school, and that of the school to the community, with the direct object of enriching both.

7. It is expected that every teacher will do those things which contribute to a classroom climate in which every student may earn status and respect from his peers.

8. A new learning situation poses threats for some children. Hence, teachers are expected to create a relatively secure emotional climate to facilitate learning. This involves attention to the emotional needs of the individuals who make up the group.

9. A number of children become "behavior problems" at times; a number of children have serious problems in learning and in the normally expected progress of growth and development. Why? Teachers are expected to have trained insights into these matters. They are expected to have the skill to diagnose difficulties and remedy them.

10. All teachers are expected to have competence in evaluating, recording, and reporting on educational matters of concern, not only to the students in the classroom but to the institution as a whole.

Instructional Guidelines Related to the Emotional (Affective) Environment of the Classroom

One of the vital components of teaching puts a great emphasis upon the feelings of children, particularly their feelings of emotional security, which are so important to the learning process. First, what are some of the more general factors which contribute to feelings of security?

1. The teacher's behavior must be highly consistent. Students have to be able to predict it and depend on it. They must be relatively sure of it. You can't be widely permissive one moment and severely restrictive the next; nor can you be gentle, warm, and accepting one moment and just the opposite a few minutes later. If you are highly inconsistent, students will not know how to relate

themselves to you; they will be insecure, and instead of relaxing as they work and study, they will be keeping one eye and one ear open. No two of us teach exactly alike; our patterns of behavior differ. Each of us however has an obligation to be consistent within our pattern when we work with a group.

2. Children need to know the limits of acceptable behavior. The teacher must let them know that there are rules and that he will hold them to the rules. There are, of course, exceptions for most unusual circumstances, but these exceptions cannot be examples of favoritism for one or a few children. It is a good idea to work these rules out with the group in the earliest meeting days and to put them in a prominent place on the blackboard or bulletin board. Children feel more secure when they know for sure what is acceptable and what is not acceptable. Note: It is not wise to have too many rules.

3. Students need to feel physically secure. They ought to feel that the teacher is their defender in all times of trouble, discomfort, or danger. Even when they are fighting with each other, children on many occasions actually want the teacher to stop the fight. If a child has an accident of some kind, he wants the teacher's help and sympathy. If a child is threatened by another child,

who may be older and bigger, he wants the teacher to intercede. If a child is not feeling well, he wants the teacher to be concerned about him. A teacher who comes to the defense of an individual child or an entire group is providing emotional security.

4. Every student feels more secure if he knows that the teacher will not diminish his status in the presence of his peers. This means that practically all punishments will be administered privately. No child should receive the scorn, ridicule, sarcasm, or name-calling of an angry or upset teacher in a group situation.

5. Students want a teacher who can save them from extremes of humiliation. Nearly all of us have learned a great deal through the mistakes we have made. Sometimes, however, a mistake made in the presence of our peers can be terribly humiliating. Sometimes a teacher can very quickly assert that he himself is partly to blame for the situation. Sometimes he can restate what a student has said in a manner that robs it of its adverse effect. Sometimes he can turn it into a joke on himself. Whatever he does, he tried to soften the significance of the mistake in order to help the student "save face."

6. Students feel more secure when the teacher is relaxed and pleasant. They like to be welcomed in the

morning and they like to have someone say good night after the last class of the day. Some teachers make it a point to shake hands with each child at the close of the school day. Others make it a point to wish them happy weekends when Friday comes to an end. Many teachers have a sense of humor and share a joke or a funny story with their class.

7. _Students feel more secure when the teacher's explanations, directions, and comments are clear and to the point._ If the teacher leaves them confused, the students feel insecure. Students have to feel free to ask questions, to say when they do not understand, and to expect a courteous response from the teacher.

8. _Students feel more secure when they are with a teacher whom they consider to be fair._ "Fair" is a word that children often use when they make comments about their teachers. It may be fair to have a rule that all children must take off their hats when they are in the classroom, but it would not be fair to require all children to wear hats of the same size. We may require all children to work, but it is unfair on many occasions to require that they do exactly identical work. Assignments, tests, and examinations should be fair; punishments and praise as well as grades and awards should be fair. A teacher who is fair adds to the emotional security of the learning situation.

9. Students feel more emotionally secure when they are respected. This means that the teacher listens to them and responds to them. At times he will ask for their help, their ideas, and their opinions. He will avoid the repeated use of such statements as "You're too young," "You're too small," or "You wouldn't understand." The teacher doesn't "run down" the group, the school, or the grade level. Instead, he takes many opportunities to acknowledge the achievements of the school and the group.

10. Students feel more secure where there is a relative absence of fear. Where the teacher's pattern of behavior includes threats, warnings or shouting, or where the teacher is often suspicious of the students or sets traps in order to catch them doing something amiss, children can feel the tension in the air. Learning suffers because their emotional security is threatened.

11. Students feel much more secure when they believe that their teacher is loyal to them. This means that the teacher keeps his promises and takes such promises seriously. It means that he will not gossip about them to other teachers and that he will not tell other students what has been told to him in confidence. It means that he will believe what the children say until there is real evidence which is contradictory.

12. Students feel more secure when school becomes a place where they can "live", not a place where they must serve time. Many kinds of behavior should be permitted so long as they do not interfere with the purposes of learning. Students want the freedom to stretch their legs once in a while or to talk quietly with their peers--sometimes to "do nothing", to be free from pressure for a few minutes.

To feel emotionally secure in the learning situation students need to feel wanted and liked. That is, they need some warmth and affection if they are to learn. They need to feel that they really belong to the group, that they are missed by the group when they are absent. They feel like rejects when they are sent out into the hall, into the cloak-room, or to the principal's office. They need to have their feelings of fear and guilt diminished and their feelings of achievement and accomplishment strengthened. They need a teacher who will listen and respond, one who is patient with their endless questions, one who is helping them to understand themselves and the world in which they live.

13. Some typical practices to avoid are listed as the following "don'ts":

use sarcasm

play favorites

insist on apologies

make threats

give overly difficult assignments

punish the entire class for the misbehavior of one or a few

appeal to fear

sit at the desk all the time

get sidetracked by irrelevant questions

tie yourself to the textbook

use a vocabulary over the students' heads

talk too rapidly or nervously

neglect the physical comfort of students in the room

express anger in front of the class

14. Some typical suggestions that are helpful include the following "do's":

know all the students' names

have the lessons well prepared

call on students whose attention is wavering

use the standards of the group to establish rules

use your voice effectively

display promptness, vitality, and enthusiasm

show a sense of humor

Suggestions for affective classroom activities eliciting pupil values: Teachers frequently recognize situations which have potential for the revealing of value-type sentiments. Such value-eliciting statements follow; some are much more appropriate for younger children, and some for those who are older.

a. If you had all the power in the world, or if you were a great magician and could change the world, what would be the very first change that you would make? The second?

b. If you had a hundred dollars given to you for your very own, how would you spend it?

c. What is more important? To have friends? To have money? To have libraries? Why?

d. You see four people who are in great danger. One of them is an artist, one is a scientist, one is a businessman, and one is a man who builds houses. You are able to save only one of them. Which one would you try to save? Why that one?

e. Of all the very famous men or women whom you have heard about, which one of them would you like to be? Why?

f. Suppose you could choose between living in some far-off time of long ago and living in our very own present time. Which would you choose? Why.

g. Tell about some experience that made you:

1. very happy,
2. very sad,
3. very excited,
4. very tired,
5. very bored, etc.

h. Tell us how the world will be one hundred years from now.

i. In regard to some current news event as reported on TV or radio or in the press, what is your reaction to this stody?

j. What are some of your reactions regarding a movie that has been shown, a story or poem that has been read, a piece of artwork that has been seen, or music that has been heard?

k. What are some things that get on your nerves, or tend to make you a bit angry?

l. What are some things that scientists have done which in your estimation are not good?

m. Take your time and prepare a statement giving your reactions to one of the following:

1. The armed services should draft women.
2. Transplanting the heart of one person into the body of another person is not a moral or religious issue.
3. Everyone should receive free medical care.
4. Education should not be compulsory.
5. Whether a person works or not, he should get a certain guaranteed income.
6. Divorce should not be allowed, or else it should be much easier to obtain a divorce.
7. Anyone who drives an automobile should be compelled to take a physical examination every year; if he doesn't pass, he should not be allowed to drive.
8. Boys and girls should have the right to vote when they are 18 years old.
9. Students should be taught much more about the history of Negroes.
10. Art should be a required course for every student in every grade, including high school.

11. It's rather silly to study foreign languages; before long, everyone will be using English.
12. If young people do something that is very wrong, they should be punished for it, and so should their parents and family.
13. What's good and what's bad about TV?
14. All of us, perhaps at some time in our lives, have told "fibs," white lies. Some people lie outrageously. What is so bad about this? What are some of the most important reasons for telling the truth?
15. It has been said, "It is better that one hundred guilty men shall go free, than to find one innocent man guilty for a crime he did not commit." What do you think of this?
16. What are some of the things about our society which you believe are in dire need of correction?

Instructional Guidelines Related to Dealing with Individual Differences Among Pupils

The aim of the teacher in handling individual differences is not to mold every student to the same pattern, but to assay the assets and liabilities of each student and to work with the individuals and groups so that members of the class, both individually and collectively, show a net profit at the end of the school year.

A. Dealing with individual differences within the classroom:

1. Ask questions which in general vary from easy to more difficult, so that all will have an opportunity to respond successfully.

2. Motivate the learners through praise and encouragement each day.

3. Enliven your class by having each student keep his own daily personal progress chart.

4. Give directions slowly, clearly and simply.

5. Organize groups within the class into ability levels and work with these individually with the help of audio aids.

6. Let the fast learner occasionally help the slow learner. An example of this in a shorthand class would be to let the accelerated student dictate to the slower students and demonstrate shorthand outlines at the board.

7. Use audiovisual aids, such as tape recorders, movies, and records, for supplementary demonstrations.

8. Encourage the pupil to set his own goals, try for them, and decide for himself how good the results are.

9. Manage practice so that the learners as individuals or in small groups can proceed at appropriate rates.

B. Dealing with individual differences outside of the classroom:

1. Assign homework with different levels of difficulty that will be in line with the different interests and purposes of the major groups in the class.

2. Have a classroom library with materials of several levels of difficulty relating to the skill subjects.

3. Provide opportunities and facilities for students to improve their skills through purposeful practice in their spare time.

4. Have out-of-class sessions to determine the root of trouble for any student encountering difficulty.

C. Some suggested techniques for teaching slow learners:

1. Never let the child fail. Organize materials and use methods which lead the child to the right answer. Provide clues where necessary. Narrow the choices he has in responding. Lead him to the right answer by rewording the question or simplifying the problem. Never leave him in a failure, but carry him along until he finds success.

2. Provide feedback so that he knows when he has responded correctly. Learning is facilitated when the child has knowledge of whether his response is correct or

not. If his response is incorrect, let him know it, but let it be only a way station in finding the correct response. Lessons should be so arranged that the child obtains an immediate feedback on the correctness of his answer. This is one of the principles used in any good programmed learning procedure. If a child is learning to write the word dog, for example, he covers the model, writes the word, then compares his response with the model, thus getting feedback on his effort.

3. Reinforce correct responses. Reinforcement should be immediate and clear. It can be either tangible, as in providing tokens, candy, etc., or it can be in the form of social approval and the satisfaction of winning a game.

4. Find the optimum level at which the child should work. If the material is too easy, the child is not challenged to apply his best efforts; if too difficult, he faces failure and frustration.

5. Proceed in a systematic, step-by-step fashion so that the more basic necessary knowledge and habits precede more difficult material.

6. Use minimal change from one step to the next to facilitate learning.

7. Provide for positive transfer of knowledge from one situation to another. This is facilitated by helping the child generalize from one situation to another. By presenting the same concept in various settings and in various relationships, the child can transfer the common elements in each. Itard, for example, when training the Wild Boys of Aveyron, noted that the boy learned to select a particular knife from a group of objects in response to the written word knife, but that when a knife of a different shape was substituted he could not respond. The child had not generalized the concept of knife; he had failed to transfer the understanding of the label to knives in general.

8. Provide sufficient repetition of experiences to develop overlearning. Many teachers have said, "Johnny learns a word one day but forgets it the next day." In such cases, Johnny probably had not had enough repetition of the word in varying situations to insure over-learning, that is, learning to the point where he will not forget it readily. Mentally retarded children seem to require more repetitions of an experience or an association in order to retain it.

9. Space the repetition of material over time rather than massing the experiences in a short duration. When a new concept is presented, come back to it again and

again, often in new settings, not as drill but as transfer to a new situation.

10. Consistently associate a given stimulus or cue with one and only one response in the early stages of learning. Do not tell the child, "This letter sometimes says a and sometimes says ah." Teach him one sound at a time until it is overlearned and then teach the other sound as a different configuration in a new setting. If the child has to vacillate between two responses he will become confused.

11. Motivate the child toward greater effort by: (a) reinforcement and the satisfaction of succeeding, (b) variation in the presentation of material, (c) enthusiasm on the part of the teacher, and (d) optimal length of sessions.

12. Limit the number of concepts presented in any one period. Do not confuse the child by trying to have him learn too many things at one time. Introduce new material only after older material has become familiar.

13. Arrange materials with proper cues for attention. Arrange materials in such a way to direct the pupil's attention so that he will learn to attend to cues in the situation that will facilitate his learning, and to learn to disregard those factors in the learning situation that are irrelevant.

14. Provide success experiences. Educable mentally retarded children who have failed in the regular grades and then been placed in a special class may have developed low frustration tolerance, negative attitudes toward school work, and possibly some compensatory behavior problems which make them socially unpopular. The best way to cope with these problems is to organize a day-to-day program presenting the child with short-range as well as long-range tasks in which he succeeds. The self-concept and the self-evaluation of the child are dependent upon how well he succeeds in the assignments given to him. Thus a special class teacher must be very careful to see not only that the child does not fail but also that he experiences positive success and knows that he has succeeded. Although this principle is applicable to all children it is particularly necessary with children who are retarded. They face enough failures in school and in life without having to repeat them over and over again in a classroom situation.

Instructional Guidelines Related to the Use of Media in Teaching

The primary modalities of the learner through which most learning occurs are the visual, auditory, and motor channels. It seems clear that no one sense modality alone is capable of ensuring thorough learning. The different modes of presentation tend to supplement and reinforce each other; several modes are often more effective than one. In a simple learning task such as spelling, best results may be expected when the child is asked to say and write the words he is spelling. The accuracy of his pronounciation would also contribute to his total spelling efficiency. Within limits, the greater variety of sensory avenues brought to bear on a subject or problem the more thorough will be the learning and the higher will be the retention. Numerous experimental studies designed to determine the effectiveness of the varied modes of presentation have been reported. Summaries of the results of this type of research are typefied by that of Allen*, who has generalized his findings related to media in education as follows:

1. Motion Pictures
    a. Knowledge of facts "... films can teach factual information effectively over a wide range of subject matter content, ages, abilities, and conditions of use. This factual learning, however, tends to be rather specific to the information communicated by the film."

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*W. H. Allen, "Audio-Visual Communications" in Encyclopedia of Educational Research, 1960, MacMillan Company.

b. Perceptual-motor skills. "There is little doubt about the effectiveness of films in teaching perceptual motor skills."

c. Concepts. "Although a frequent criticism of instructional films is that learning from them is "passive" and interferes with thinking and the development of concepts and inferences, there is no experimental research to support this negative suppostion. On the contrary, the evidence is on the side of the film in developing concepts."

d. Motivation, interests, attitudes, and opinions. "... films can modify motivations, interests, attitudes, and opinions if they are designed to stimulate or reinforce existing beliefs of the audience. There is, however, little evidence that films can make changes if they are contrary to the existing beliefs, personality structure, or social environment of the individual in the audience."

2. Television. "Teaching by television is effective at all levels of instruction from elementary school to military training. In very few cases has TV instruction been found to be inferior to conventional instruction, and in many cases TV was significantly more effective."

3. Radio and Recordings. "... relatively few basic studies have been made of the effectiveness of radio and recordings in teaching factual information and in changing attitudes and interests. In general, radio and recordings were found to be at least as effective as conventional teaching methods and to be liked by students."

4. Film Strips and Slides. "...the superiority of the motion picture probably resulted from the greater adaptability of movies for portraying interacting events, whereas the superiority of the filmstrip was probably due to the slower rate of development used in the actual presentation of the filmstrip to the audience."

Some Suggestions for Classroom Practice:

1. Before deciding to use an instructional aid, a teacher should know its contents thoroughly. He should preview it to determine its possibilities for teaching a particular topic.

2. The learner should be prepared to watch for certain items in advance of their presentation and he should be held responsible for the information they provide. Such presentations may consist of giving some "hints" or pointers on significant materials to be observed. This preliminary preparation may also include reference to items not particularly relevant to the discussion at hand. If it is

desired to measure the effect of a particular aid, a pretest may be given. Such a test, when repeated after a showing, provides a basis for measuring the amount of learning that has occurred.

3. After seeing an aid, the group should have a discussion to develop the main points. This discussion should show the relationship the contents of the aid has to the topic under consideration and indicate any features that have been bearing on the effectiveness of the aid.

4. Instructional aids should receive consideration when tests are prepared to measure accomplishment. The effects of such aids may be measured immediately following their use, or they may be made a part of more comprehensive examinations to be given later. The point to be emphasized is that the learner should be held responsible for their content in the same manner that he is held responsible for any other material presented by textbook, teacher or collateral reading.

Summary of Steps in Media Selection by Teachers

Step	Description
1.	Define the boundary conditions.
2.	Decide between individual and group instruction.
3.	Identify the characteristics of the learners.
4.	Identify a competency to be analyzed.
5.	List the general instructional events to be used.
6.	List the special instructional events.
7.	Arrange the entire list of events in the desired order.
8.	List the type of stimuli for each event.
9.	List the alternate media.
10.	Make a tentative media selection.
11.	Review an entire series of tentative media choices.
12.	Make final media choices for package units.
13.	Write a prescription to the specialist for each package unit.
14.	Write a prescription for the teacher.

Cost and Other Considerations Related to Various Instructional Media

Instrument	Media used	Materials production considerations	Availability of facilities and equipment	Equipment Cost
1. Filmstrip of slide projector	35mm filmstrips or 2x2 slides	Inexpensive; may be done locally in short time	Usually available; requires darkened room	Low
2. Overhead transparency projector	Still pictures and graphic representations	Very inexpensive; may be done locally in short time	Available; may be projected in light room	Low
3. Wall charts or posters	Still pictures	Very inexpensive; may be done locally in very short time	Available; no special equipment needed	Very low
4. Motion pictures (projection to groups)	16mm motion picture (sound or silent)	Specially produced; sound film is costly and requires 6-12 months time	Usually available; requires darkened classroom	Moderate

Instrument	Media used	Materials production considerations	Availability of facilities and equipment	Equipment cost
5. Motion picture projection as repetitive loops (8mm silent) to individuals	8mm motion picture film (silent)	Special production normally necessary; may be produced as 16mm film alone or locally at low cost and in short time	Not normally available; will need to be specially procured to meet requirement of instructional program	Low per unit, but moderate for groups
6. Magnetic tape recorder	¼" magnetic tape	Easy and inexpensive; usually produced locally	Available	Low
7. Record player	33 1/3, 45 or 78 rpm disk recordings	Need special recording facilities, usually commercially made	Usually available	Low
8. Display area	3-D models	May vary in complexity and in difficulty of production; component parts easy to obtain	Available	Varies from low to high

Instrument	Media used	Materials production considerations	Availability of facilities and equipment	Equipment cost
9. Television (closed-circuit)	Live presentations, motion picture film video tape recordings, still pictures	Normally requires large and skilled production staff	Not normally available	Moderate to high
10. Teaching machines and programmed textbooks	Programmed material	Some programs available commercially; but will normally be specially prepared for course	Not normally available	Low per unit but moderate for groups
11. System combinations	Television, motion pictures, still pictures, audio recordings	Complex probably will be done locally to meet specific requirements	Not normally available	Moderate to high

Source: Klausmier, H. & Ripple, R.; Learning & Human Abilities, New York, Harper Row Pub., 1971, pp. 148-149.

Unit V Summary and Review: Selected Important Principles of Learning

1. The learning process is experiencing, doing, reacting, and undergoing. The more active the participation of the learner, the more effective the learning. Attempted recall or recall with self-prompting results in better learning than simply rereading the same material. Re-presentation without recall is consistently ineffective, particularly in retention. In addition, the individual who participates actively develops greater interest in what he is learning even though his grades may not improve. All these findings point to the fact that we learn and recall only that to which we respond and in the degree to which we respond. We do not remember the stimulus but rather what we did in response to the stimulus.

2. Behaviors that are reinforced (rewarded) are more likely to recur. Most normal children, youths, and adults enjoy doing those things that are pleasurable to themselves and/or others. The type of reward that has the greatest possibility of applying to other life situations is the kind one gives oneself - the sense of satisfaction found in meeting a challenge or accomplishing a personal goal. We sometimes refer to these as ego-rewards. Reward, to be most effective in encouraging learning and continued motivation to learn, should follow as soon after the successful completion of a task as possible. Threat and punishment have generally unpredictable effects upon learning. This is, punished responses may or may not occur again.

3. Learning is facilitated when there is a healthy balance between limits and responsibility and autonomy and freedom in the classroom.

4. The learning process is stimulated to best effort when it encourages a diversity of learning opportunities and experiences. The best was to help students form a general concept is to present the concept in numerous and varied specific situations, and then to encourage formulations of the general idea and its applications in situations different from those in which the concept was learned. No school subjects are markedly superior to others for "strengthening mental powers." General improvement as a result of study

of any subject depends on instruction that encourages generalizations about principles, concept formation, and improvements of techniques of study, thinking, and communication. The learning process is stimulated to best effort when it operates within a rich and varied environment. Sameness, either in the teacher or in learning setting, dulls attention and stifles motivation.

5. The learning process and achievement are significantly influenced by a student's goals and aspirations (motivation). Most students will persist through difficulties, over obstables, and through unpleasant situations to the extent that they see the objectives as worthwhile and the goal attainable. Many students progress in any area of learning only as far as they need to go in order to achieve their progress. Often they do only enough to "get by"; with increased motivation they improve. The learning process, initiated by need and purpose, is likely to be motivated by its own incompleteness, although extrinsic (outside) motives or encouragement may sometimes be necessary and/or desirable.

6. The learning situation, to be of maximum value, must be perceived by the learner as realistic, meaningful, and useful. The learning process proceeds most effectively when the experiences, materials, and desired results are adjusted to the maturity and experiential background of the student.

7. Learning proceeds best when the student can see the results. Through knowledge of his status and progress, he reaches a personally meaningful level of insight and understanding. All of this contributes to the development of a desirable self-concept, which in turn affects how and what he learns. Sheer repetition of a learning task without feedback or any indication of how to improve or change inhibits progress in learning.

8. Individual differences among learners must be both recognized and accomodated by the teacher. Students vary not only in their present abilities and learning but in their rate of growth and the "ceiling" that represents their potential level of achievement as well. Some slow growing students may eventually surpass students who seemed far ahead of them in grade school. Ability to learn generally increases with age up to adult years.

9. *Forgetting proceeds most rapidly at first - then more slowly*. Deliberate recall immediately after learning reduces the possibility of forgetting new material. Learning from reading is enhanced more by time spent recalling what has been read than by simply rereading.

10. *The experience of learning by sudden insight into previously puzzling situations arises when*: (a) the student has sufficient background and preparation; (b) attention is given to relationships operative in the whole situation; and (c) the task is meaningful and within the range of ability of the student. The most effective learning effort is offered by students when they attempt tasks that fall in the "range of challenge" - not too easy and not too hard - where success seems possible not not certain.

Finally, some important humanistic considerations related to the learning process:

School learning will be facilitated when pupils are treated as persons rather than things.

Learning will be facilitated when the pupil knows that his voice is heard and that his vote is really being counted.

Learning is facilitated when one knows that he is accepted, recognized, and that his presence makes a difference.

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